

CLAIM LISTING

1. (Currently Amended) A molten metal reactor including:

- (a) a treatment chamber having a treatment chamber inlet;
- (b) a molten reactant metal flow inducing arrangement for inducing a flow of molten reactant metal into the treatment chamber through the treatment chamber inlet;
- (c) a feed chamber having a feed chamber outlet located adjacent to the treatment chamber inlet;
- (d) an output chamber connected to an outlet of the treatment chamber to receive molten reactant metal and reaction products from the treatment chamber; ~~and~~
- (e) a supply chamber connected to the output chamber and to the treatment feed chamber; and
- (f) a feed chute having a feed material inlet into the feed chamber through which a feed material to be treated in the molten reactant metal enters the feed chamber, the feed chute also having a portion extending into the feed chamber so that the feed material inlet into the feed chamber is positioned within the area defined by the feed chamber and spaced apart from the boundaries of the feed chamber.

2. (Original) The molten metal reactor of Claim 1 wherein the feed chamber outlet and the treatment chamber inlet comprise a common opening.

3. (Original) The molten metal reactor of Claim 2 further including a vortex inducing arrangement for inducing a swirling flow in the feed chamber outlet.

1 4. (Original) The molten metal reactor of Claim 2 wherein the feed chamber comprises a
2 bowl shaped chamber and the feed chamber outlet is located in substantially the center of
3 the bowl shape at a bottom of the feed chamber.

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5 5. (Original) The molten metal reactor of Claim 2 further including an impeller mounted in
6 the feed chamber and adapted to be rotated about a substantially vertical axis.

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8 6. (Original) The molten metal reactor of Claim 2 including an off-center molten reactant
9 metal inlet to the feed chamber through which molten reactant metal is introduced into
10 the feed chamber to induce a swirling flow in the feed chamber.

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12 7. (Original) The molten metal reactor of Claim 1 wherein at least a portion of the treatment
13 chamber is in a heat transfer relationship with the supply chamber.

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15 8. (Original) The molten metal reactor of Claim 1 further including a gravity trap within the
16 treatment chamber.

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18 9-16 Canceled

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20 17. (New) The molten metal reactor of Claim 1 wherein the feed material inlet into the feed
21 chamber is positioned directly above the feed chamber outlet.

1 18. (New) The molten metal reactor of Claim 1 wherein the feed chute is connected to a
2 sealing conduit that extends to a position below a liquid reactant metal level in the feed
3 chamber.

4
5 19. (New) A molten metal reactor including:

- 6 (a) a treatment chamber having a treatment chamber inlet;
7 (b) a feed chamber having a feed chamber outlet located adjacent to the treatment
8 chamber inlet;
9 (c) an output chamber connected to an outlet of the treatment chamber to receive
10 molten reactant metal and reaction products from the treatment chamber;
11 (d) a molten reactant metal source connected to direct molten reactant metal into the
12 feed chamber; and
13 (e) a feed chute having a feed material inlet into the feed chamber through which a
14 feed material to be treated with the molten reactant metal enters the feed chamber,
15 the feed chute also having (i) a portion extending into the feed chamber so that the
16 feed material inlet into the feed chamber is positioned within the area defined by
17 the feed chamber and is spaced apart from the boundaries of the feed chamber,
18 and (ii) a feed material release structure for selectively releasing the feed material
19 through the feed chute toward the feed chamber.

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21 20. (New) The molten metal reactor of Claim 19 wherein the molten reactant metal source
22 includes a supply chamber connected between the output chamber and the feed chamber.

- 1 21. (New) The molten metal reactor of Claim 20 further including at least one molten metal
2 pump for inducing a flow of molten metal from the supply chamber to the feed chamber.
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- 4 22. (New) The molten metal reactor of Claim 19 wherein the feed material inlet into the feed
5 chamber is positioned directly above the feed chamber outlet.
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- 7 23. (New) The molten metal reactor of Claim 22 wherein the feed chute extends substantially
8 vertically.
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- 10 24. (New) The molten metal reactor of Claim 19 wherein the feed chute is connected to a
11 sealing conduit that extends to a position below a liquid reactant metal level in the feed
12 chamber.
13
- 14 25. (New) The molten metal reactor of Claim 19 wherein a portion of the feed chute extends
15 transversely through the feed chamber in a direction from one lateral side of the feed
16 chamber toward an opposite lateral side of the feed chamber.

- 1 26. (New) A molten metal reactor including:
- 2 (a) a treatment chamber having a treatment chamber inlet;
- 3 (b) a feed chamber having a feed chamber outlet located adjacent to the treatment
- 4 chamber inlet;
- 5 (c) an output chamber connected to an outlet of the treatment chamber to receive
- 6 molten reactant metal and reaction products from the treatment chamber;
- 7 (d) a molten reactant metal source connected to direct molten reactant metal into the
- 8 feed chamber; and
- 9 (e) a feed arrangement for releasing feed material into the feed chamber at a point that
- 10 is spaced apart from a lateral wall of the feed chamber and adjacent to the feed
- 11 chamber outlet, the feed material comprising material to be reacted with the
- 12 molten reactant metal.
- 13
- 14 27. (New) The molten metal reactor of Claim 26 wherein the feed arrangement includes a
- 15 feed chute extending vertically through a portion of the feed chamber.
- 16
- 17 28. (New) The molten metal reactor of Claim 26 wherein the feed arrangement includes a
- 18 feed chute having a portion that extends transversely through the feed chamber in a
- 19 direction from one lateral side of the feed chamber toward an opposite lateral side of the
- 20 feed chamber.